Unit title	Unit 10: Climate Change
Guided learning hours	60
Number of lessons	30
Duration of lessons	2 hours
Links to other units	
Unit 8: Contemporary Issues in Science Unit 18: Astronomy and Space Science Unit 24: Pollution and Waste Management Unit 25: Water Quality Unit 26: Animal Conservation Unit 27: Ecosystems Unit 28: Sustainable Energy	

Key to learning opportunities			
AW	Assignment writing	**PA**	Preparation for assessment
GS	Guest speaker	**V**	Visit
IS	Independent study	**GW**	Group work

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
Learning aim A: Understand the fundamental aspects of the Earth's atmosphere and its history				
1	**A1 Evidence and theory of early atmosphere composition** • Introduction to the unit	IS GW	• **Tutor presentation:** Introduce the unit: ○ Show a 3D model and/or projected images of the Earth, showing what it looks like from space and how some climatic events can be seen. ○ Provide an overview of the unit aims: to understand the fundamental aspects of the Earth's atmosphere and its history; to research and develop an understanding of the evidence for	• Tutor presentation • 3D model or projected images of the Earth • Specification

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
	• Development of the Earth from nebula gases • Pre-biological life atmosphere		atmospheric change related to 'greenhouse gases'; to investigate the measures outlined by the Intergovernmental Panel on Climate Change (IPCC) to combat future climate change. o Discuss the unit content, the assessment methodology and the possibility of visits and/or guest speakers. o Emphasise that this is a research-based unit with few opportunities for practical work. • **Individual activity:** Give each learner a simplified list of the unit content and ask them to indicate their prior knowledge (e.g. using colour-coding to mark content they are confident about, content they have heard of, and content they have not heard of). This will help you to tailor the delivery of the unit to meet learners' needs. • **Tutor-led discussion:** Ask the following questions to assess learners' current knowledge and understanding: o How was the Earth formed? o When was it formed? o What did it look like at different stages of its formation? o How has the composition of the Earth's atmosphere changed? • **Tutor presentation:** Show a short video that gives a timeline for the formation of the Earth. (Search for a suitable video online using terms such as 'origin and evolution of the Earth' or 'Earth timeline'.) • **Small group work:** Ask learners to work in groups to research and produce posters, PowerPoint presentations and/or models to describe the formation and structure of the Earth and its early atmosphere. They will continue this activity in the next lesson and present their work to the rest of the class in lesson 3.	• Video about formation of Earth • Research materials, including internet access • Materials for posters and/or models • Presentation software

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
2-3	**A1 Evidence and theory of early atmosphere composition** • Development of the Earth from nebula gases • Pre-biological life atmosphere • Physical evidence in ancient sedimentary rocks	GW	• **Tutor-led discussion:** Show some examples of sedimentary rocks and discuss how they were formed. Show and explain the evidence to indicate chemical reactions and biochemical processes, and discuss fossils and stromatolites. You could use videos to illustrate some of this content. • **Small group work:** Learners continue their group work on the formation and structure of the Earth, adding information about physical evidence in ancient sedimentary rocks of chemical reactions and biochemical processes. • **Learner presentations:** Learners present their research work to the class. Encourage other learners to take notes and ask questions. • **Tutor-led discussion:** Consolidate knowledge and understanding from lessons 1–3. Encourage learners to review their own and others' work, offering constructive feedback and suggestions for improvement.	• Tutor presentation • Samples of sedimentary rocks • Videos • Research materials, including internet access • Materials for posters and/or models • Presentation software

4	**A2 Changes to the atmosphere with time**
	• The Earth's crust
	• Historic evidence of photosynthesis
	• Changes in atmosphere composition
	• Volatile compounds
		GW	• **Lead-in:** Recap the early origin of the Earth, summarising the key ideas from the learner presentations in the previous lesson. Discuss, consolidate and – if necessary – extend learners' knowledge of the Earth's crust (rocks, oceans, atmosphere).
			• **Tutor presentation:** Outline changes to the Earth's atmosphere with time.
			  ○ Remind learners of the pre-biological atmosphere.
			  ○ Discuss the changes to the atmosphere over the past 4.5 billion years due to the development of plant life.
			  ○ Discuss the historic evidence of photosynthesis and the timescale (approx. 3 billion years ago).
			  ○ Discuss the volatile compounds found in the atmosphere (see specification) and their sources.
				• Tutor presentation
				• Research materials, including internet access
				• Materials for leaflets

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
			○ Use videos and simulations if you wish, to engage learners. Some of this content may have been covered in the learner presentations in lesson 3. • **Small group activity:** Learners work in small groups; each group should produce an information leaflet showing a timeline of the key changes to the Earth's atmosphere over time, with explanations of these changes. These leaflets should also list the volatile compounds found in the atmosphere.	
5-6	**A2 Changes to the atmosphere with time** • Changes in atmosphere composition • Sources and sinks • Residence time	IS/GW	• **Tutor presentation:** Consolidate work to date on changes to the atmosphere. Remind learners of: ○ early anaerobic chemosynthetic life ○ the appearance of photosynthesis and complex aerobic life forms ○ the way these changes led to a gradual build-up of oxygen, reaching a peak of 35% by 300 million years ago (during the carboniferous era) and then falling to the current 21%. • **Tutor-led discussion:** Ask learners what they know about: ○ carbon sources (ways of adding CO_2 to the atmosphere) ○ carbon sinks (ways of removing CO_2 from the atmosphere) ○ the residence time of atmospheric molecules (carbon dioxide, oxygen, nitrogen). Use videos or animations if necessary to illustrate these ideas. • **Individual/small group activity:** Learners research and make notes on: ○ the residence time of atmospheric molecules ○ carbon sinks (plants, the ocean, soil)	• Tutor presentation • Videos and/or animations • Research materials, including internet access • Quiz

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
			○ carbon sources (forest fires, decomposition, human activities (e.g. burning fossil fuels, cement production, deforestation), respiration). Some learners may wish to produce a poem, song or rap about carbon sinks and/or sources; this work could be shared with the class. • **Tutor-led quiz:** Summarise and consolidate work on carbon sources, carbon sinks and residence time.	
7	**A3 Development and understanding of present-day atmosphere composition** • Main gases and percentage composition • Atmospheric layers	GW	• **Tutor presentation:** Outline the current % composition of atmospheric gases (78% nitrogen, 21% oxygen, 1% argon, 0.04% carbon dioxide, and other trace gases). Recap earlier learning about the changes leading to the current composition. • **Small group activity:** Ask learners to research and prepare presentations or posters on the layers of Earth's atmosphere: troposphere, stratosphere, mesosphere, thermosphere, exosphere. You could ask each group to focus on a single layer, or ask all groups to provide information on all layers. For each layer, learners must research: ○ altitudes in kilometres ○ characteristics ○ composition ○ properties. • **Learner presentations:** Learners present their research findings to the class. Encourage other learners to take notes and ask questions, particularly if each group focused on a different layer. • **Tutor presentation:** Summarise and consolidate learners' knowledge and understanding of the composition of the atmospheric layers.	• Tutor presentation • Research materials including internet access • Materials for posters • Presentation software

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
8	• Formative assessment • Preparation for assessment of Learning aim A	PA IS	• **Individual activity:** Learners review their work for this unit so far and use it to produce a concept map with the formation of the Earth at the centre and links to: o theories about how the Earth was formed from nebula gases o the formation of rocks, oceans, atmosphere o the main gases in the current atmosphere o sources and sinks of atmospheric gases o residence times of molecules in the atmosphere o atmospheric layers. • **Individual work:** Learners identify any weaknesses in their understanding and carry out further research to improve their knowledge. • Learners hand in their concept maps and any additional research work for marking and feedback.	• Learner notes from previous lessons • Specification • Research materials including internet access
9-10	• Assessment of Learning aim A	AW	• **Tutor presentation:** When you are satisfied all learners have sufficient knowledge and understanding of the unit content, hand out the brief for assignment 1. Remind learners: o about the glossary of terms used in internal assessment materials o that the command words in the assessment criteria must be met fully o that secondary sources must be referenced o that they must meet the deadline for submission for the assignment. • **Individual work:** Learners work independently to complete the tasks and produce evidence to meet the assessment criteria. Monitor learner progress, offering general support and guidance if required.	• Assignment brief for Learning aim A • Research materials, including internet access

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
Learning aim B: Undertake research to develop an understanding of the evidence for atmospheric change related to 'greenhouse gases'				
11-12	**B1 Evidence of atmosphere changes since the start of industrialisation** • Changes in carbon dioxide abundance over the last 200 years • Bio-geo-chemical cycle • Carbon cycle • Fossil fuels (oil, coal and gas) • Carbon sinks (soil, plants, oceans)	IS/GW	• **Lead-in:** Introduce the learning aim by sharing a song or poem about greenhouse gases/global warming/climate change. Suitable resources are available online. • **Tutor-led discussion:** Show images of the changes caused by the industrial revolution, from the 1750s to the present day. Ask learners how they think these changes have affected the atmosphere. Learners should be aware of the extraction and combustion of fossil fuels, and the increasing use of intensive agriculture since 1950. • **Tutor presentation:** Describe the bio-geo-chemical cycle and explain why it is important. Briefly discuss how substances move between various living and non-living forms and locations in the biosphere. (Consider nitrogen, phosphorous, sulfur, oxygen and water.) Learners should make brief notes. • **Individual/small group activity:** Learners complete various activities focused on the carbon cycle. o Learners carry out a role play, using small balls/beads to represent carbon atoms. They move the 'carbon atoms' to or from different parts of the carbon cycle (atmosphere, water, plants/animals, rocks, soil, etc.) represented by other learners, or by labelled locations within the classroom. Instructions are available online: search 'carbon cycle role play'. o Learners find out how long carbon dioxide lasts in the atmosphere. o Learners find or create an annotated diagram of the carbon cycle, then present it to another group for peer assessment.	• Stimulus material (poem, song etc.) • Tutor presentation • Images of changes caused by the industrial revolution • Small ball/beads • Research materials including internet access

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
			• **Small group activity:** Learners find online data about atmospheric carbon dioxide levels over the last 200 years. This data will show steady cycles of peaks and trough before 1950 (180–300 ppm), followed by a rapid increase (300–410 ppm) since 1950. Learners discuss the data in groups, then nominate a spokesperson from each group to present their main findings to the class. Ensure all learners make notes and reference their data sources appropriately. Make links with prior learning about carbon sinks. • **Tutor-led discussion:** Consider the reliability and validity of different data sources.	
13	**B1 Evidence of atmosphere changes since the start of industrialisation** • Seven cycles of glacial advances and retreats • Evidence from ice core drilling, sediments, tree rings, coral reefs	IS/GW	• **Lead-in:** Show images of glacial advances and retreats over the last 800,000 years. • **Individual/small group activity:** Learners research the seven cycles of glacial advances and retreats and produce a poster or storyboard showing the timeline of events. • **Individual/small group activity:** Learners research the question, 'How do we know what the atmosphere was like in the past? What evidence can we use?' Answers include: o ice core drilling (Antarctica, Greenland, glaciers) o sediments from the ocean floor o tree rings o bands in the hard 'shells' of coral. You could ask individual learners or groups to focus on particular evidence sources. They should produce PowerPoint presentations or information leaflets to present their findings.	• Images of glacial advances and retreats • Tutor presentation • Research materials including internet access • Presentation software and/or materials for leaflets

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
14-15	**B1 Evidence of atmosphere changes since the start of industrialisation** • Milankovitch cycles • Changes to the orbit of the Earth • Increase in methane levels	IS/GW	• **Tutor presentation:** Show images of the Earth and its orbit to illustrate how the orbit has changed over time. Ask: o What are the possible effects of changes to the Earth's orbit? (Climate, as they affect the amount of sunlight.) o Who was Milutin Milankovitch and what are Milankovitch cycles? (He was a Serbian scientist who hypothesised that long-term changes to the Earth's orbit are responsible for climate changes.) • **Individual/small group activity:** Learners research and make notes on theories about changes to the Earth's orbit and the effects on climate. • **Tutor-led discussion:** Guide learners to answer the following questions: o Where does methane in the atmosphere come from? (You could show images to represent the following sources: cattle, landfill sites, leaks from fuel operations, agriculture.) o Why are methane levels important? (You could show a graph of increasing methane levels in the atmosphere. Some sources state the amount of methane in the atmosphere has increased from 722 parts per billion (ppb) in pre-industrial times to 1866 ppb in 2019) Methane retains 84 times more heat per unit mass than carbon dioxide, so is a major contributor to global warming.) o For how long does methane stay in the atmosphere? (About a decade.) • **Individual/small group activity:** Learners consolidate their understanding of the importance of methane by producing a leaflet, poster or blog. They present their work to the class for peer review and feedback. Remind learners to reference any sources correctly.	• Tutor presentation • Research materials including internet access • Resources for leaflets, posters or blogs

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
16	**B1 Evidence of atmosphere changes since the start of industrialisation** • Temperature patterns • Effect of CO_2 and other gases on passage of infra-red radiation through the atmosphere • Loss of ice sheets and glacial retreat • Sea level rise • Extreme weather events • Increase in acidity of oceans • Melting of permafrost	GW IS	• **Tutor-led discussion:** Show graphs to illustrate global temperatures over the last 50 years. Ask learners to identify patterns and trends, including: o five of the warmest years on record have been since 2010 o there has been a 0.4°C increase in ocean temperatures to depths of 700 m over the last 50 years. • **Small group practical work:** Learners simulate the warming effect of carbon dioxide: o Apparatus: A sealable gas jar, vinegar, bicarbonate of soda, a thermometer and a light source. o Method: Switch the light on and off to simulate day and night, and measure the temperature over time. o Control: The same apparatus but with no vinegar and no bicarbonate of soda. o More details: Search for 'climate change in a bottle'. • **Individual activity:** Learners source images and diagrams to illustrate the greenhouse effect and annotate them to explain the impact of carbon dioxide and other gases on the passage of infra-red radiation through the atmosphere. • **Small group activity:** Learners find examples and/or case studies to explain how the greenhouse effect is linked to rising global temperatures and: o loss of ice sheets, glacial retreat, loss of snow cover o rising sea levels (20 cm over the last 100 years) o more frequent and more severe extreme weather events o an increase in ocean acidity o melting of permafrost.	• Graphs of global temperature changes • Practical apparatus: gas jars, vinegar, bicarbonate of soda, thermometers, light sources • Research materials, including internet access

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
			• **Tutor-led discussion:** Groups share their research findings. Encourage learners to take notes and ensure everyone has information about all the key effects of global warming.	
17	**B2 Nature and causes of greenhouse gases** • Carbon dioxide • Water vapour • Nitrous oxide • Methane gas • Chlorofluorocarbons (CFCs)	IS GW	• **Individual activity:** Each learner produces a mind map or list of human (anthropogenic) activities which have affected the environment since the start of the industrial revolution. They then create a separate mind map or list of natural activities. • **Small group activity:** Learners create a set of cards about greenhouse gases. On one side of each card, they write the name of one of the following gases. On the other side, they state where the gas comes from and explain its effects. o carbon dioxide o water vapour o nitrous oxide o methane gas o chlorofluorocarbons (CFCs). • **Individual/small group activity:** Pose the question: 'What is the evidence for anthropogenic climate change?' Give learners a list of websites providing data for and against the argument that human activities are responsible for increasing greenhouse gas levels and, thus, global warming. (For example, the NGSS Science and Engineering website is a good source of data.) Learners make notes or create a presentation outlining the main arguments and reaching a justified conclusion. They should consider human activities such as: o deforestation o burning of fossil fuels and biomass o changing land use	• Research materials, including internet access • Blank cards • List of websites • Presentation software (optional)

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
			○ use of fertilisers/agriculture ○ landfill sites ○ ruminant digestion ○ production of CFCs. • **Tutor-led discussion:** Learners share their research findings and their conclusions. Discuss their data and encourage learners to assess the reliability of the sources used.	
18	**B3 Possible future trends of atmosphere changes and their effects** • Rise in atmospheric levels of CO_2 and the 'greenhouse effect' • Variation of warm and cold areas on the Earth's surface • Increase in extreme weather • Increased sea level rise from glacial and polar ice melting • Changes in plant growth • Displacement of populations	IS	• **Tutor-led discussion:** Show images of local, regional, national and global weather-related events. Ask learners to discuss/debate whether such events will become more frequent in the future and to predict their impact on the atmosphere. • **Individual activity:** Learners make notes on trends, causes and possible future impacts of atmospheric changes, locally, regionally, nationally and globally. They could consider effects: ○ on agriculture ○ on coastal communities ○ of increasingly extreme weather ○ of sea level rise and polar ice melting. • **Individual activity:** Learners access videos and/or simulations about climate change modelling. Useful search terms are: 'future climate change, simulations', 'future global warming' and similar keywords. The NASA website is likely to be useful. • **Formative assessment:** Learners hand in their notes for feedback.	• Tutor presentation • Images of weather-related events • Research materials, including internet access

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
19-20	**Assessment of Learning aim B**	AW	• When you are satisfied all learners have sufficient knowledge and understanding of the unit content, hand out he brief for assignment 2. Remind learners: o about the glossary of terms used in internal assessment materials o that the command words in the assessment criteria must be met fully o that secondary sources must be referenced o that they must meet the deadline for submission for the assignment. • **Individual work:** Learners work independently to complete the tasks and produce evidence to meet the assessment criteria. Monitor learner progress, offering general support and guidance if required.	• Assignment brief for Learning aim B • Research materials, including internet access

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
Learning aim C: Investigate the measures outlined by the Intergovernmental Panel on Climate Change (IPCC) to combat future climate change				
21	**C1 Climate change forums and the IPCC** • Intergovernmental Panel on Climate Change (IPCC) • United Nations Framework Convention on Climate Change (UNFCCC) • Conference of the Parties (COP) • Paris Agreement 2016 • Youth Climate Summit initiative • G8 summits	GW	• **Tutor presentation:** Show video footage and/or photographs of Greta Thunberg and/or the strike action by students in 2019 to raise awareness of climate change. Encourage learners to discuss their understanding of the issues raised. • **Tutor-led discussion:** Ask learners if they are aware of any forums or panels on climate change (e.g. the Kyoto agreement, Paris agreement or G8 summits). If possible, share images and/or audio clips of some of these forums. Discuss the function of such forums. • **Small group activity:** Allocate to each group one of the following: o Intergovernmental Panel on Climate Change (IPCC) o UN Framework Convention on Climate Change (UNFCCC) o Conference of the Parties (COP) o Paris Agreement, 2016 o Youth Climate Summit initiative o G8 summits. Learners research and produce an information leaflet about their chosen group, describing the: o composition of the group (e.g. member states/countries) o aims/role of the group o directives/actions/targets produced and when o impact and/or targets met in recent years. • **Learner presentations:** Leaners share their findings with the rest of the class. Encourage other learners to take notes, ask questions and offer constructive feedback.	• Tutor presentation • Video footage, photographs and/or audio of Greta Thunberg, student strikes and climate forums

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
			• **Individual activity:** Learners draw up a list of questions to ask the visiting speaker in lesson 23.	
22	**C1 Climate change forums and the IPCC** • Confirmation of scientific data and scientific agreement	GW	• **Tutor-led discussion:** Referring to learners' research findings about climate change forums, consider how data can be validated and scientific agreement reached. There is no definitive answer so guide learners to debate issues concerning the validity and reliability of scientific data collection and analysis. You could make links with *Unit 4: Investigative Project Skills* and/or *Unit 8: Contemporary Issues in Science*. • **Small group activity:** Learners search keywords such as 'validating data', 'climate change modelling' or 'reliability climate models' to find articles about the process of climate modelling and validation of climate change models. Each group should choose and discuss at least one article. • **Tutor-led discussion:** Learners share their research findings.	• Research materials, including internet access

23	**C1 Climate change forums and the IPCC**
	• Agreement that human activities are the main cause of current climate change
		V	• **Before the session:** Arrange for a guest speaker to talk to learners.
			  ○ The speaker could be from one of the organisations researched by learners, or from an environmental group, local council/government etc.
			  ○ If necessary, this could be a virtual visit (using Skype, Face Time, Zoom or a similar platform).
			• **Lead-in:** Introduce the guest speaker.
			• **Guest speaker:** The visiting speaker explains their role and the actions they are taking to mitigate the effects of climate change. If possible, they should also discuss the data they use in their work and explain how they ensure this information is accurate and reliable. Allow time at the end of the talk for learners to ask questions.
				• Guest speaker
				• Learner questions (prepared in lesson 21)

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
			• **Tutor-led discussion:** Summarise the key information from the speaker's lecture and encourage learners to share their thoughts.	
24	**C1 Climate change forums and the IPCC** • Agreement that human activities are the main cause of current climate change	GW	• **Lead-in:** Explain that this lesson will focus on a class debate. Learners will need to argue for or against the motion: 'Human activities are the main cause of current climate change'. • **Group activity:** If there is an even split in opinion, allow learners to arrange themselves into teams for the debate. Otherwise, divide the class in two and instruct one group to argue for the motion while the other argues against. Allow time for groups to prepare their arguments, using evidence collected during the unit so far. • **Learner presentations:** Each group appoints a spokesperson to summarise their key arguments and share them with the rest of the class. • **Whole class activity:** Having heard arguments for and against, learners vote on the motion, 'Human activities are the main cause of current climate change.'	• Learner notes • Presentation software (optional)
25	**C2 Changes to industrial methods and science innovation** • Main greenhouse gas emitters	IS GW	• **Tutor-led discussion:** Discuss the following questions: o What are the main activities involved in producing greenhouse gases? o Which countries are the highest producers of greenhouse gases? (China, the EU and the USA contribute more than half of total global emissions, according to the World Resources Institute). Note learners' initial suggestions on the board or on flipchart paper. • **Individual activity:** Learners research definitive answers to the questions above and feed back to the class. • **Tutor-led discussion:** Guide learners to evaluate the reliability of the source materials used. Remind them of the key questions to ask, e.g.	• Whiteboard or flipchart paper • Research materials, including internet access

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
			○ Who compiled the data? ○ When was the data compiled? ○ How was the data collected? etc.	
26	**C2 Changes to industrial methods and science innovation** • Renewable energies • Nuclear power • Increasing fuel efficiency in transportation • Increased use of electric and hydrogen fuel cell cars, buses, trains, industrial transport	GW IS	• **Tutor presentation:** Share a song or poem to remind learners about alternative energy sources. Ask learners to list the main renewable energy sources. • **Tutor-led discussion:** Discuss the question: 'Should nuclear power be used to produce energy?' You could end the discussion by asking learners to vote by a show of hands. • **Small group activity:** Ask each group to research one of the following renewable energy sources and prepare a summary of advantages and disadvantages: ○ solar panels ○ wind turbines ○ geothermal ○ hydroelectric ○ hydrokinetic ○ nuclear. • **Learner presentations:** Groups share their research findings with the class, while other learners take notes and ask questions. • **Tutor-led discussion:** Discuss the question: 'How can fuel efficiency in transportation be increased?' Learners should record the suggested ideas in a spider diagram or concept map. • **Formative assessment:** Check learners' work and provide feedback.	• Tutor presentation • Research materials, including internet access • Presentation software (optional)

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
27-28	**C3 Changes that can be made by individuals** • Reduction in personal carbon emissions • Adapting in larger communities to lessen the impact of climate change • Introduction of SMART meters • Installation of solar roof panels and heat pumps	IS/GW	• **Tutor-led discussion:** Ask learners what the term 'carbon footprint' means. Do they ever consider their own carbon footprint? • **Individual activity:** Learners use an online carbon footprint calculator to assess their own impact. • **Small group activity:** Learners produce a poem, presentation or storyboard to identify the changes individuals and communities can make, now and in the future, to reduce their carbon footprint. For example: ○ changes to personal transport (e.g. type of fuel, private vs public transport, active transport, communal transport) ○ switching from fossil to renewable fuels ○ home heating/cooling and lighting choices ○ energy efficient housing (e.g. solar panels, heat pumps, wind turbines, use of SMART meters, communal heating/energy schemes) ○ dietary choices (e.g. reduced meat consumption, use of locally grown products) ○ choice of goods and appliances (e.g. energy efficiency) ○ recycling. • **Learner presentations:** Learners share their work with the class for peer assessment and discussion. Ask questions if necessary to check the breadth and depth of learner knowledge and understanding.	• Access to an online carbon footprint calculator • Research materials, including internet access • Presentation software (optional)

Lesson	Topic	Lesson type	Suggested activities	Classroom resources
29-30	**Assessment of Learning Aim C**	AW	• **Tutor presentation:** When you are satisfied all learners have sufficient knowledge and understanding of the unit content, hand out the brief for assignment 3. Remind learners: o about the glossary of terms used in internal assessment materials o that the command words in the assessment criteria must be met fully o that secondary sources must be referenced o that they must meet the deadline for submission of the assignment. • **Individual work:** Learners work independently to complete the tasks and produce evidence to meet the assessment criteria. Monitor learners progress, offering general support and guidance if required.	• Assignment brief for Learning aim C • Research materials, including internet access

Pearson is not responsible for the content of any external internet sites. It is essential for tutors to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that tutors bookmark useful websites and consider enabling students to access them through the school/college intranet.